

## PUBLIC ABSTRACT

Applicant (primary) name: FuelCell Energy Inc

Applicant's address: 3 Great Pasture Road, Danbury, CT 06813

---

**Team Members (if any):**

(listing represents only participants  
at time of application, not necessarily  
final team membership)

Name: Southern Company Services

City: Wilsonville

State: AL

Zip Code: 35186

---

Proposal Title: HIGH EFFICIENCY CLEAN COAL FUEL CELL/TURBINE  
POWER PLANT DEMONSTRATION

Commercial Application: New Facilities: ☒ New Direct FuelCell/Turbine® Power Plant  
fueled by the existing coal gasification test facilities at the Power Systems Development Facility  
in Wilsonville, Alabama

Existing Facilities

Other, Specify

Technology Type: Direct FuelCell/Turbine® Hybrid Power Plant to be operated  
on coal derived gas

Estimated total cost of project:

(May not represent final negotiated costs.)

Total Estimated Cost: \$ 32,052,685

Estimated DOE Share: \$ 16,026,342

Estimated Private Share: \$ 16,026,342

## **PUBLIC ABSTRACT (cont'd)**

### **Anticipated Project Site(s):**

Location (city, county, etc.) Danbury, Fairfield County, CT 06813  
(Design, Engineering, Project Management)

Location (city, county, etc.) Torrington, Litchfield County, CT 06790  
(Fuel Cell Manufacturing, Power Plant Test and Conditioning)

Location (city, county, etc.) Wilsonville, Shelby County, AL 35186  
(Demonstration of Power Plant)

Type of coal to be used: Primary: Powder River Basin Sub-Bituminous

Alternate (if any): Bituminous

Size or scale of project: 2 MW Direct FuelCell/Turbine Power Plant fueled by coal derived gas

### **Duration of proposed project:**

(From date of award) March, 2003, 40 Months

---

### **PRIMARY CONTACT:**

For additional information, interested parties should contact:

Name: George Steinfeld  
Position: Director/Systems Development  
Telephone Number: (203) 825-6122  
Company: FuelCell Energy Inc.  
e-mail address: [gsteinfeld@fce.com](mailto:gsteinfeld@fce.com)  
Address: 3 Great Pasture Road  
Danbury, CT 06813

---

### **Alternative Contact:**

Name: Ross Levine  
Position: Director of Contracts & Contracts Counsel  
Telephone Number: (203) 825-6057  
Company: FuelCell Energy Inc.  
e-mail address: [rlevine@fce.com](mailto:rlevine@fce.com)  
Address: 3 Great Pasture Road  
Danbury, CT 06813

## **HIGH EFFICIENCY CLEAN COAL FUEL CELL/TURBINE POWER PLANT DEMONSTRATION**

In response to DOE's Round 1 Clean Coal Power Initiative Program Solicitation (No. DE-PS26-02NT41428), FuelCell Energy, Inc. (FCE) proposes to design, build and test a 2 MW Direct FuelCell/Turbine® (DFC/T®) Hybrid Power Plant operating on coal derived gas.

The approach proposed for this project is to integrate an oxygen-blown transport reactor coal gasifier followed by syngas purification and partial methanation, with power generation in a Direct FuelCell/Turbine hybrid power plant which incorporates a high temperature pressurized air expander. Preliminary analysis indicates that this system can generate electricity utilizing coal on a commercial scale (200 MW) at an efficiency of over 55% (HHV basis) with 80% CO<sub>2</sub> separation from the coal gas and very low emissions. This efficiency level is a least 8-10% efficiency points higher than can be achieved in integrated gasification combined cycle (IGCC) power plants that can be designed today with technology anticipated to be available in 2010. Further improvements in several of the broad spectrum of technologies that DOE is sponsoring in support of the Vision 21 program have the potential to increase efficiency of the proposed system above the 60% efficiency (HHV) target level of the Vision 21 program.

This 40-month project will demonstrate the integrated operation of the proposed system utilizing the existing Transport Reactor gasifier at the Power Systems Development Facility operated by Southern Company Services in Wilsonville, AL. The gasifier will be operated in an oxygen-blown mode for this demonstration. Modular facilities will be installed at the site to clean the gas to the levels required for methanation and subsequent conversion to electricity in a modular 2 MW Direct FuelCell/Turbine hybrid power plant.

FCE is a leading developer and manufacturer of carbonate fuel cell power plants. The Company is wholly focused on the development and commercialization of its Direct FuelCell® technology, so named because of its ability to operate directly on hydrocarbon fuels without the use of an external reformer. Currently, FCE is developing a hybrid Direct FuelCell/Turbine power plant under DOE's Vision 21 program. The objective of this Vision 21 program is to generate operational data for the design of a 40 MW high efficiency, Vision 21 power plant. FCE has also been active in the development of coal-based fuel cell power plant operation, and currently plans to demonstrate a simple cycle 2 MW coal gas fuel cell power plant under the DOE/Kentucky Pioneer Energy L.L.C. IGCC project.

Southern Company Services is a major industrial participant in the Power Systems Development Facility pilot project near Wilsonville, Alabama. This pilot project is an engineering scale demonstration of coal-powered systems with the objective of providing data for commercial scale-up.